WHAT IS CLAIMED IS:

1. A method of sharpening a digital image having image pixels according to its material content, comprising the steps of:

a) generating a subject matter belief map corresponding spatially to the image pixels, having belief values indicating the likelihood that respective image pixels are representative of a particular subject matter;

b) generating a noisy pixel belief map corresponding spatially to the image pixels having belief values indicating the likelihood that the modulation about respective pixels are due to system noise;

c) generating gain map from the subject matter belief map and the noisy pixel belief map having gain values that indicate the degree of sharpening to be applied to the image pixels; and

d) using the gain map to sharpen the image.

2. The method as claimed in claim 1, wherein the step of using the gain map to sharpen the image includes performing sharpening with an unsharp mask operation.

3. The method as claimed in claim 2, wherein the gain map comprises scale factors used in the unsharp mask operation.

4. The method claimed in claim 1, wherein the gain map is modified so that the gain values do not exceed a predetermined limit in areas where the noisy pixel belief map indicates belief that the pixel is noisy.

5. The method claimed in claim 4, wherein the predetermined limit is 1.3.

6. The method claimed in claim 4, wherein the predetermined limit is applied only to the gain values of pixels when the following two conditions are met: 1) the gain value of the pixel in the gain map $\beta(x,y)$ is greater than the noise sharpening limit N_{sl}; and 2) the pixel has non-zero belief that the pixel is a noisy pixel.